

Smartphone Dependency and Consciousness: Observing Flow in the Everyday Life

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Background: Excessive use of technology has led to neural change that is impacting people of all ages on many levels, of which children and adolescents are the most vulnerable [1]. These effects are cognitive [2], emotional [3], social [4], and also relate to their conscious awareness of the world around them [5]. Studies confirm a range of psychiatric disorders that have been correlated with excessive use of computer games and Internet use, including: ADHD, weakening of cognitive focus and shallower thinking skills, reduction of creativity and problem solving skills, a lowered ability to filter out extraneous information, adverse effects upon psychosocial development, hyperactivity and behavioral problems, feelings of isolation, depression, anxiety and restlessness, and an inability to form meaningful and long-lasting relationships, leading to abnormal or anti-sociopsychology [6,7,8]. Moreover, studies using MRI technology show the effects of brain activation patterns on middle age adults that use online searching, suggesting sensitivity of brain neural circuits and the “potential for negative brain and behavioral effects, including impaired attention and addiction” [9, p. 124]. These are examples of the neurological changes as a result of extreme mediation during increased use of non-invasive technologies such as interactive games and the Internet.

Problem: In addition to the aforementioned technologies, an increased dependence on mobile technology (e.g., smartphones) has created an even greater neuro-psychological and neuro-social effect on users [10,11,12,13,14,15]. The focus of our research addresses the effects of smartphone use and its potential for altering human consciousness in everyday life. We define consciousness as the inner state of being and intrinsic governing structures of human awareness. Chalmers refers to it as self-inwardness, self-awareness, and attention, voluntary control, knowledge, introspection, reportability, and awakeness [16]. For centuries, human artifacts of cultural mediation, such as tools for work, have evolved from clubs to hammers to machines of the industrial age. Electronic tools/technologies, however, have never become so indistinguishably interwoven and prevailingly rooted within the development of our consciousness. Specifically, smartphones have become psychological tools that extend the conscious mind in the way we distribute thoughts, memories, exchange information and ideas, and fortify our personal relationships [17].

Aim: The aim of our research is to probe a segment of a very complex and broad area of consciousness research. While psychologists propose possible reasons for smartphone addiction owing to its ability to alter mood and trigger enjoyable feelings, it is not fully known if repetition of use is correlated to flow [18,19] and other areas of development. Hence, the aim of this study is to identify smartphone dependency and its relationship to consciousness and the experience of flow and mood in everyday life. Research questions include: Does smartphone use create dependency and in what way is flow a factor? Does smartphone use alter human consciousness?

Method: Participants included 24 graduate students. Three data collection methods include: (1) The Experience Sampling Method (ESM) to observe levels of flow and reported measures of activity and conscious awareness. Participants logged subjective experience seven times per day throughout three consecutive days for two weeks of days with and without cell phone use. (2) Face-to-face interviews, self-reporting personal experience during the six-day study, and (3) Post-test demographic questionnaire.

Results: Initial results from method one show a significant increase in flow strength ($Z = 13.94, p < .001$), consciousness ($Z = 12.65, p < .001$) and positive mood ($Z = 11.32, p < .001$) between the days students used and did not use their smartphones respectively. Participants showed increased consciousness on second day (without cell use) as compared with the first and third days.

Broader Implications: Vygotsky [20] argued that consciousness results when humans perpetually construct their sociocultural environment by engaging in activity. In the analysis of the social mind, he suggested that through the use of tools during activity the natural psychological functions of the mind are re-structured and distributed. Technologies such as smartphones are engendering a new kind of psychological tool that is radically transforming consciousness. For this reason, we hold that a symbiosis between human life and artificial life is causing an evolving sociocultural mind: a form of cyborg consciousness [21]. While this study is still in progress, early results show that human consciousness and our deeply subjective experiences of everyday life can be impacted by the technologies we use.

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